MARINE REVIEW.

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Magnitude of Investments in Iron Ore on the Lakes.

At the Fifth International Congress on Inland Navigation held in Paris a few weeks ago, Mr. George H. Ely of Cleveland, was a delegate from the American Society of Civil Engineers, and read a paper on the Great Lakes of North America. On Thursday evening of this week Mr. Ely read the paper again by request in Cleveland before members of the board of trade and board of industry. The paper deals largely with the iron ore business of the lakes, and in this regard is most interesting. Attention is especially directed to the importance of the Lake Superior iron district, which produces more than one-half of the ores for the vast iron and steel industries of this country. It is shown clearly that Lake Superior ore could never have gone on wheels to meet the coal of the central states. Deep water communication with the northwest alone rendered the present development of Lake Superior iron ore possible. The magnitude of investments in Lake Superior ore mining and in its distribution will appear from the following, which is a part of the paper:

Capital in mines in the four Lake Superior districts in 1889 as per United States census	$54,825,122	$ 69,825,122
Increase to July 1, 1892	15,000,000	
Capital in docks and their equipments at Lake Superior, and Lake Michigan ports, built and used exclusively for shipping ore (official)		9,885,665
Capital employed exclusively in railroad transportation of ore from mines to shipping ports on Lake Superior and Lake Michigan (official)		27,014,594
Floating capital on the lakes, employed exclusively in ore transportation, from upper lake to lower lake ports (estimated)		29,933,107
Capital in docks and in their equipments, for receiving and forwarding ore exclusively, at Lake Erie ports, between Toledo and Buffalo, inclusive of both (official)		12,392,880
Capital employed exclusively in railroad transportation of ore, inland to mills and furnaces from Lake Erie ports (official)		26,343,617
Total		$ 175,394,985

As showing the chemical constitution of Lake Superior ores in general Mr. Ely presents the following average analyses of Lake Superior ores, No. 1 best grade, comprising 85 per cent. of the total hard ore production and 90 per cent. of the total soft ore production. The analyses are averages of 100 cargoes of each kind of ore mentioned and the samplings for the same were made at Lake Erie ports by Rattle & Nye, of Cleveland, during the shipping season of 1889:

Designations.	Metallic iron.	Silica.	Phosphorous.	Alumina	Lime.
Hard Bessemer	67.55	2.05	0.041	0.35	0.080
Hard non-Bessemer	67.22	2.51	0.147	0.27	0.122
Soft Bessemer	62.68	5.90	0.040	2.09	0.224
Soft non-Bessemer	62.71	6.12	0.215	1.99	0.186

Designations.	Magnesia.	Sulphur.	Manganese	Organic and Volatile matter.
Hard Bessemer	0.111	0.028	0.124	0.48
Hard non-Bessemer	0.141	0.033	0.142	0.52
Soft Bessemer	0.142	0.030	0.440	1.78
Soft non-Bessemer	0.213	0.048	0.371	1.42

Struggle for More Aids to Navigation.

In accordance with a promise made by the river and harbor committee of the present congress, no river and harbor bill will be presented at the next session. An effort will be made, however, by the shipping interests of the lakes to, secure aids to navigation for which appropriations were refused in the last congress. These different lights, fog signals, etc., are included in the following estimates just made by the light-house board:

Fog signal at Eagle Harbor, Mich., $5,500; fog signal on Galleo Island, N. Y., $5,700; range lights at Maumee, Ohio, $4,100; range lights at Menasha, Mich., $5,000; light at Old Mackinac point, Mich., $1,100; light station on Poe's reef, Mich., $25,000; fog signal on South Fox island, Mich., $5,500; fog signal at Tibbett's point, N. Y., $4,300; light at Wilson harbor, N. Y., $2,500; constructing buoyage at Chicago, necessitated by the world's fair, $29,500; completing lighthouse and fog signal at easterly end of the breakwater, Chicago, $15,500; fog signal at Escanaba, Mich., $1,100; range lights at Grassy island, Detroit river, Mich., $8,000; fog signal at Oswego, N. Y., $4,300; patrol steamer for St. Mary's river, Mich., $4,000; fog signal at Pere Marquette, Mich., $5.500; tender for the ninth district, $95,000; light station at Bayfield, Wis., $5,000; temporary floating lights on Bay State and Old Point shoals, N. Y., $800; fog signal at Big Sable, Mich., $5,500; light station at Carlton, N. Y., $8,600; light and fog signal station at Chequamegon point, Wis., completion of, $100; lighthouse at Devil's island, Wis., $22,000; light station at the mouth of Eagle river, Mich., $20,000; light and fog signal at Fairport, Ohio, $4,700; light and fog signal station at Forty Mile point, Mich., $25,000; light station at Gladstone, Mich., $10,000; light and fog bell at Grand Marais, Mich., $15,000; light and fog signal station at Little Gull island, Mich., $20,000; light and signal at Ludington, Mich., pier, $4,500; light station at Manitowoc, Wis , $5,000; light station at Mendota, Mich., $7,500; light and fog signal station at North Manitou, Mich., $20,000; light station at Port Clinton, O., $1,500; fog signal on pier head of Portage lake ship canal, $5.500; light station on Portage lake, $3,500; fog signal on pier head at Presque Isle, Pa., $4,300; light and fog signal at Round island, Mich., $15,000; fog signal on pier head at St. Joseph, Mich., $5,000; light station on St. Mary's island, Mich., $15,000.

Documenting of a Vessel Transferred to Foreign Flag.

A collection of decisions from the treasury department for the months of July and August, contains the following:

TREASURY DEPARTMENT,
BUREAU OF NAVIGATION,
WASHINGTON, D. C., Aug. 15, 1892.

Collector of Customs, Marquette, Mich.—

SIR: I transmit herewith for ready reference a copy of a letter from the deputy collector of customs at Sault Ste. Marie relative to a tug, the name of which he fails to specify, and which, therefore, can not be entered on the records of the department according to the usual course of procedure. He inquires whether an American-built tug, hull, boilers, and engine, "owned by an American citizen and transferred to Canada," may now be documented by said American citizen as a vessel of the United States. He reports that the owner is not a full citizen, but declared his intention to become one fifteen years ago, and is willing to take out final papers.

The law forbids the documenting in the United States of a vessel which has been sold or become the property of an alien, except under certain circumstances not understood to exist in the present case. Had the owner been an American citizen, the mere fact that the vessel was "transferred to the Canadian flag" since the close of the "war of the rebellion" would not necessarily preclude the granting of documents in the United States. (Sections 4135, 4136, 4165, and 4172, revised statutes, articles 8, 9, and 75, regulations of 1884.)

This office understands that the law contemplates full citizenship in such cases; that is to say, there must be a declaration of intent, a residence for a continued term of five years next preceding admission, the takin of an oath to support the constitution, and actual admission by a court of competent jurisdiction, unless the case falls within section 2166 or 2174, revised statutes. Please advise the deputy collector acccordingly.

T. B. SANDERS,
Acting Commissioner.

The Late R. K. Winslow.

THE LATE R. K. WINSLOW.

Another gentleman who was prominent in the building up of the present lake marine passed away in the death of Mr. Rufus K. Winslow, who died at his home in Cleveland last week. In 1854 he and three brothers succeeded the father in a large vessel business and line boat agency. With his brothers from then until the present time he owned or controlled 120 different lake craft. Some years ago the brothers took up other business interests and of late the Winslow fleet has comprised only a few vessels. Although in poor health for several years, Mr. Winslow did not, however, cease to take an active interest in the management of the vessels which he controlled personally. The Cleveland Board of Trade and local members of the Lake Carriers' Association passed fitting resolutions and the officers of the latter organization attended the funeral in a body.

Iron Ore Shipments and Lake Freights.

It will be surprising to the iron ore and vessel interests to learn that shipments of iron ore from all upper lake ports to Oct. 1 of this season are larger by 381,664 gross tons than on the same date in any previous season. The shipments to Oct. 1 for three years are:

To Oct. 1.	Gross tons.
1892	6,861,639
1891	5,066,860
1890	6,479,975

Figures from which the total so far this season is derived are official in every case excepting Escanaba, and it is certain that the amount put down for that port is not 10,000 tons out of the way.

Some improvement in the iron trade generally during the present month is in part the cause of this heavy movement of ore, and it is not improbable that shipments will continue fairly active to the close of the season. There is accordingly a very strong feeling in the lake freight market, which has been gaining in strength for the past ten days. The grain movement gives promise of holding out to the end of the season, and although there has been some talk of a blockade at Buffalo, there is no actual delay from that source as yet. At this writing the rate on wheat from Duluth to Buffalo is on the verge of an advance to 4 cents, and Ashland ore shippers who want boats can get none short of $1.25. The Marquette rate on ore is $1.05, but Escanaba shippers, who are benefited by profitable rates on coal to Lake Michigan, have succeeded in getting all the tonnage they require at 75 cents. Lake Michigan coal freights are in better shape than they have been at any time during the season, hard coal paying 70 cents to Chicago and 65 cents to Milwaukee.

The Railway Side of it—Cost of Transportation.

A. T. HADLEY IN YALE REVIEW.

The demand for improvement of waterways at national expense is largely based on the idea that water transportation is cheaper than railroad transportation. It will surprise most readers to be told that this is by no means clearly the case. A few figures will show that the difference in favor of canals is apparent rather than real. Railroad freight differs from canal freight in the fact that the public demand quick transit. To compare a railroad with a canal, we must assume that the company is allowed time to wait for full train loads. Even if it waited 48 hours to make its train loads to suit itself, the goods would probably arrive at their destination much quicker than by canal. Now on any line where a good canal can run, a railroad can handle a net train load of 600 tons, at a direct expense for fuel, train men and train repairs of not over 40 cents a mile, and sometimes as low as thirty. This means a cost to the road of one-fifteenth or one twentieth of a cent a mile per ton, or less than that on any ordinary canal—not much larger, in fact, than the cost on good natural water routes.

Why then, may it be asked, if railroad expenses are so low, are railroad charges so much higher? For several reasons. First, because the government pays the expense of constructing the canals and water improvements from the pockets of the tax-payers, while the railroad, being built by a private company, must pay maintenance and interest. It is obviously unfair to compare a part of the cost of canal transportation with the whole cost of railroad transportation. Take the cost by the Erie canal and the New York Central Railroad. In a rate war like that with the West Shore in 1885, the railroad gains traffic at the expense of the canal. Quality of service being taken into account, the canal cannot compete on even terms with the railroad, when the railroad rates do not pay interest. On the other hand, experience with canal tolls has shown that, where the canal tries to pay interest, so far from being able to compete, it can get no traffic at all. In the case of a work like the Erie canal, which has existed for years and has paid for itself twice over, it may be fair to treat the artificial waterway like a natural one, and disregard interest and maintenance in comparing it with the railroad. But where it is a question of expending new capital on a large scale, it is unfair to compare a part of the cost of canal transporation—that of movement alone—with the whole cost of transportation—movement and maintenance together.

Another reason for the apparent economy of canals is found in the arbitrary course which governments have pursued toward railroad rates. There has been, on the whole, a persistent effort to force railroads to adopt a mileage basis wherever it could be imposed, and a somewhat arbitrary schedule of distance charges in all cases. The more arbitrary has been the system of charges, the less use has the public had of its railroads, and the greater has been the apparent necessity for canals. In Germany, for instance, canals are a necessity because the government insists on charging ten times as much for a thousand miles as for a hundred, although it is doubtful whether the expense of the one is quite double that of the other. If you insist on forcing up through railroad rates by short haul clauses, you may have some need of canals; if you adopt equal mileage schedules, you will have a great deal of need for canals. But is it because the legislation in either case has prohibited that adjustment of railroad rates which corresponds to the best interests of railroad economy or public economy.

There is one large class of exceptions, and only one, to the generalization that railroads are a more economical means of transportation than canals. Where a comparatively short artificial water route connects two long natural ones, the saving of trans-shipment may be so great as to justify works of this kind. The Sault Ste. Marie canal furnishes a marked instance of this kind, the Suez canal another. How far the Nicaragua canal would fulfil the same conditions, can only be a matter of conjecture. In all cases of this kind, the shipper is enabled to get the benefit of the long natural water route, where nature furnishes the water route; there is no charge for interest, and in such cases it can be left out. But where government furnishes the water route, there is a charge for interest, paid by somebody, even though it be not incorporated in the transportation rate itself. To treat an appropriation by congress on the same basis as a free gift of God, involves a fallacy in accounting and a dangerous precedent in practical legislation.

Big White Star Liner.

The White Star Liner to be built at Belfast, Ireland, will be called Gigantic, and will, if reports regarding her dimensions are to be relied upon, be much larger than the new Cunarders. She will be 700 feet long by 65 feet 7½ inches beam, of 45,000 horse-power, and to steam 22 knots from port to port. It is rumored that the boat will attain a maximum speed of 27 knots, and cross the Atlantic in four and one-half days. She will have three screws. Two of the screws will be fitted similiar to those in the Majestic and the third will be central and similar in position to the single screw of an ordinary steamer. Work on the boat will not begin till next year, and it is expected that she will be ready for sea in April, 1894.

The MARINE REVIEW and the MARINE ENGINEER, London, one year for $4. Write the MARINE REVIEW.

Record of Speed and Big Cargoes.

[*Masters or owners of freight boats are invited to report improvements on this list.*]

Iron ore: Maritana, Minnesota Steamship Company of Cleveland, 4,260 gross, or 4,771 net tons, Escanaba to South Chicago; Maryland, Inter-Ocean Transportation Company of Milwaukee, 3,663 gross, or 4,103 net tons, Escanaba to South Chicago, draft 17 feet 4 inches.

Grain: E. C. Pope, Eddy Bros. of Bay City, 125,730 bushels of corn, Chicago to Buffalo, draft 14 feet 8 inches; Owoko, Minch estate, Cleveland, 113,829 bushels of wheat, Chicago to Buffalo; W. H. Gilcher, J. C. Gilchrist of Cleveland, 113,820 bushels of wheat, Chicago to Buffalo.

Coal: E. C. Pope, Eddy Bros. of Bay City, 3,930 net tons anthracite, Buffalo to Chicago.

Speed: Owego, Union Line of Buffalo, Buffalo to Chicago, 889 miles, 54 hours and 16 minutes, 16.4 miles an hour.

Iron Mining.

VALUE OF LEADING STOCKS.

Quoted by Chas. H. Potter & Co., No. 104 Superior St. Cleveland, O.

Stocks.	Par Value.	Bid.	Asked.
Cleveland-Cliffs Iron Company	$100 00	$.....	$ 65 00
Champion Iron Company	25 00	.....	58 00
Chandler Iron Company	25 00	45 co	47 00
Jackson Iron Company	25 00	.....	75 00
Lake Superior Iron Company	25 00	40 00	41 00
Minnesota Iron Company	100 00	70 00	75 00
Pittsburgh & Lake Angeline Iron Co.	25 00	.....	140 00
Republic Iron Company	25 00	10 00	12 00
Ashland	25 00	.....	.....
Section Thirty-three	25 00	.....	5 00
Brotherton	25 00	2 00	2 50
Iron Belt	25 00	2 25	2 50
Aurora	25 00	8 25	.....

The movement of iron ore from all upper lake ports is shown elsewhere and there is presented here the shipments of the different mines from Two Harbors and Ashland. Shipments from Two Harbors up to and including Wednesday, Oct. 7, aggregated 992,088 gross tons, of which 562,892 tons were from the Chandler, 415,625 tons from the Minnesota, 2,525 tons from the Pioneer and 11,046 tons from the Zenith mine. On the same date shipments from Ashland aggregated 1,997,135 gross tons, divided among the different mines as follows: Ashland 172,381 tons, Aurora 263,469, Colby, No. 1, 4.761, Colby, No. 2, 51,-850, Rand 17,700, Tilden 201,646, Iron Belt 138,650, Montreal, south vein, 3,383, Montreal, north vein, 30,142, Palms 57,093, Section 33, south vein 4,619, Section 33, north vein 3,133, Anvil 4,217, Brotherton 90,677, Comet 33,707, Carey 32,131, Newport 114,037, Imperial 5,803, Norrie 350,741, East Norrie 166,916, Odanah 4,373, Pabst 44,447, Eureka 8,317, Sunday Lake 43,332, Windsor 26,673, Jack Pot 2,717.

The Minnesota Iron Company has secured a lease of another piece of mining property on the Vermillion range. It is about a mile east of Ely and the lessors are A. M. Miller and John G. and E. D. Brown, of Duluth. The lease runs for thirty years and the royalty is 25 cents a ton with a guaranteed minimum output of 20,000 tons. Payment of royalty is not compulsory under the lease until Oct. 1, 1894, but work on the property with diamond drills will be pushed immediately, and if the showing is promising development will begin with a view to shipping ore next season.

Articles of incorporation of the Oliver Mining Company, of Minnesota, have been filed in the office of the register of deeds. The corporation will carry on a general mining and manufacturing business. The incorporators are Henry W. Oliver, Henry R. Rea and Chas. D. Frazer of Pittsburg, Geo. E. Tener and Edward D. Reis of Allegheny City, Pa., and Edward Floada, of Duluth. The principal office will be Duluth. The capital stock is to be $1,200,000, divided in 12,000 shares of $100 each. —Vermillion Iron Journal.

In taking 3,930 net tons of anthracite coal from Buffalo to Chicago the big steamer E. C. Pope was put to considerable extra expense through grounding at Grosse point, but at last accounts she had succeeded in continuing the voyage without leaving any portion of the cargo behind. The load is larger by several hundred tons than any coal cargo ever carried on the lakes.

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CHICAGO LAKE INTERESTS.

WESTERN OFFICE, MARINE REVIEW,
No. 13 Western Union Building, CHICAGO, Ill., Oct. 13.

The well-known "Diamond D" appeared on Hausler's tugs at South Chicago last Monday. The extension of the Dunham Line is a good deal of a surprise to Chicago river tugmen, but it was a move which had been under contemplation for several months. South Chicago is destined to be the second port on Lake Michigan. Every increase in the cost of navigating Chicago river is driving commerce to the Calumet. This year's business at that port is largely in excess of all previous records, and there is no reason for disbelieving that the increase will be maintained. Another elevator will be built at South Chicago next season, the Illinois Steel Company will receive as much if not more ore than this year, and the coal and grain trades are steadily growing. Capt. Dunham has been in luck in getting in on the ground floor in the tug business at so promising a point.

It is not at all certain even yet that Chicago tugs are going to continue to burn hard coal. The owners of several tugs flatly refuse to burn hard coal, saying that they prefer to pay the fines for making smoke. It all depends now on the ability of the Society for the Prevention of Smoke to make it so warm for the users of soft coal that they will find it cheaper to burn hard coal. Otherwise all tugs will return to the use of soft coal inside of a week.

The old side-wheeler Pearl arrived here from Buffalo Tuesday, and will go into the World's Fair business for a concern bearing the name of "The World's Transportation and Excursion Boat Company." Why Chicago should be made the graveyard of old excursion boats has never been made plain, but such is the case. The Pearl is to travel between State street bridge and a pier to be built south of the world's fair grounds on what is known as the "Willard Tract."

Water tube boilers will be put in the tug Mollie Spencer the coming winter. It is reported that this new style of boiler will find its way into some of the big steel steamers to be built during the coming winter. On several yachts here this pattern of boiler has been tried with best results. In a test made up the south fork of the south branch fully twice as much was accomplished as with the old style boilers.

Shippers here are talking of very low grain rates. They claim that the rate on corn to Buffalo will go to 1 cent a bushel before the close of navigation. They are of the opinion that if iron ore ceases to move freely the grain trade will be glutted with boats, and vessel men will be falling over each other to get cargoes.

Underwriters are feeling better since good weather came this week. The margin between payments received and losses paid on the whole had come to be very limited. On the other hand, grain insurance has been extremely profitable, and several companies have been compelled to to take the profits on grain to make up the losses on hulls.

Walking Delegate Miller, who threw stones at the captain of the schooner John Wesley at South Chicago, is in hard luck. Miller was wanted in Buffalo for the assault on the crew of the Mabel Wilson on the high seas. The Seamen's Union was extremely anxious to keep him here and have his trial in the state courts. He had been bound to the grand jury in $1,000 bonds for the attack on the Wesley, and this, it was hoped, would prevent the officers from taking him back to Buffalo. His bondsmen surrendered him to the sheriff, and then the United States marshal got him away from the sheriff, and took him to Buffalo. In the federal court there Miller is believed to be good for five or six years in the penitentiary. Here it was likely that he would escape punishment altogether.

Grain at Chicago and Duluth.

Stocks of grain at Chicago and Duluth on Monday, the 10th inst., were:

	Chicago.		Duluth.
	Wheat, bu.	Corn, bu.	All wheat, bu.
In store	8,303,936	4,927,437	3,653,523
Increase during the week	809,313	264,215	499,092
Increase over same time last year	4,888,922	3,263,514	.....

In addition to the above there is 2,505,969 bushels of oats, 333,603 bushels of rye and 167,133 bushels of barley in store in Chicago.

Official Numbers and Tonnage.

Official numbers were assigned to two lake vessels during the week ending Oct. 8 by the bureau of navigation, E. C. O'Brien commissioner: Sail—Hattie LeRoy, Grand Haven, Mich., tonnage gross 8.99, net 8.54, No. 96,197. Steam—Ann Arbor, No. 1, Toledo, tonnage gross 1,127.76, net 563.88, No. 106,974.

Experiments are being made every few days with the Baker sub-marine boat at Detroit. Commodore Folger and other officers of the navy are expected to give the boat a final test soon in the Detroit river. On account of the strength of hull of the present craft it cannot be sunk more than fifteen feet under the surface. The inventor is now satisfied that the boat is a success.

Building Capacity Increased.

Special Correspondence to the MARINE REVIEW.

DETROIT, Mich., Oct. 13.—The statement that the Detroit Dry Dock Company, on account of the great amount of work they had on hand, would not be able to take any more contracts for boats to be ready for the early part of next season, should be corrected. With the completion of a new slip at Wyandotte, the company's yard facilities at that point have been doubled and the new engine and boiler shops built during the summer give them almost three times the former capacity for turning out work in boilers and machinery. In case the Wyandotte yard is filled it is understood from reliable sources that a steel plant would be arranged for on the site of the Orleans street wooden yard.

The rumor that the Detroit Dry Dock Company will build four steel steamers for the Ogdensburg Transit Company, is founded only on the fact that the transit company needs more boats, having chartered two Lehigh liners for loads from Cleveland to Chicago this fall. If a contract is made it will undoubtedly be with the dry dock company and it is not improbable that a contract for one boat will be made.

The Pioneer has taken the fancy of one of Detroit's vessel owners, and he is quite in the notion of having one like her. This and some consideration of a line of steamers to run across Lake Michigan from South Haven to Milwaukee, is about all the stir in proposed new work here.

The Detroit Boat Works closed a $40,000 contract this week for twenty-five launches for the Electric Launch and Navigation Company, to be run on the lagoon at the world's fair. Each launch will be 36 feet long, making over a sixth of a mile of boats, if placed in a line, to be turned out during the coming winter.

The recent race on Long Island sound between a paddle steamer and a propeller in which the latter won, and the advantage in comfort on a stern-wheel steamer in heavy weather has caused some comment among vessel owners in Detroit as to the action of the Detroit & Cleveland Steam Navigation Company in building the two paddle wheel boats to run between Toledo and Mackinaw, it being the intention to extend this line to Toledo next season. The difference in speed with the same power and additional carrying capacity are advantages, however. The new boats will appear almost exactly like the City of Cleveland and Detroit with the exception of having but one stack.

There is probably as little complaint now from passengers carried by the Detroit, Belle Isle and Windsor Ferry Company as from any public carrier in the country. Comfortable cabins are provided on the boats and even the nervous systems of passengers are taken into consideration, for in a set of rules put up on each boat the captain is commanded not to keep his boat headed into the course of the boat from the opposite shore, the rule adding that it may be safe enough but that it distresses timid passengers.

The new foundry being built by the Berlin Iron Bridge Company for S. F. Hodge & Co., is nearing completion and when it is finished it will be the most complete foundry for exclusively marine work on the lakes. An immense engine building plant is also contemplated.

Against Free Logs—Canadian Marine.

Special Correspondence to the MARINE REVIEW.

KINGSTON, Ont., Oct. 13.—Gilmour & Co., the large lumberers, have addressed a letter to the board of trade saying among other things; "We view with alarm the large quantity of unmanufactured logs being shipped annually from Canada to the United States, and the great disadvantage Canadians are at in bidding on limits put up for sale by the government, owing to there being a duty of $1 per thousand feet on lumber, while there is no export duty on logs." The letter further asks the board to co-operate in getting the government to postpone the sale of limits until some satisfactory arrangement has been reached between the two governments concerning the canal tolls, so that the matter can be intelligently discussed. "Either that," continues the letter, "or make it compulsory to manufacture the logs in Canada before they can be exported."

Hugh Ryan, contractor for the Sault Ste. Marie canal, had a lengthy conference recently with the minister of canals. The object of the consultation was to settle the terms on which the contractor would agree to rush the work through to completion in order to give Canada an independent highway to Lake Superior. So far as can be learned an arrangement, mutually satisfactory, was arrived at, Mr. Ryan agreeing to have the canal ready for use by the autumn of 1893. Upon what terms he agreed to forestall by two years the stipulated time for the completion of the contract has not transpired, but it is claimed that the consideration is based on a very close estimate of the extra expense likely to be entailed, and that is said to be very much below what was at first generally supposed to be the figure ($250,000) at which it would pay to put the work through next year.

Recently a lively discussion took place here as to whether a tow of barges could be taken down the river St. Lawrence without the American channel being used. The matter has been practically settled. On Wednesday one of Calvin & Co.'s steamers towed a large raft down the river, en route to Quebec, without the use of the American channel. The Canadian route is somewhat intricate, but this trip has shown it to be perfectly safe. A survey of the American channel is now being demanded. The present one was not charted for boats drawing 16 feet of water or more, and there are many spots in it unsafe for big steamers.

St. Mary's Falls Canal Traffic in September.

The total number of net tons of freight passing through the St. Mary's Falls canal in September was 1,661,303, of which 1,233,403 tons was eastbound and 427,900 tons westbound. Following is a classification of the tonnage:

	Eastbound.	Westbound.
Coal	.....	363,673 tons.
Flour	755,802 bbls.	120 bbls.
Grain	.....	16,660 bu.
Corn	425,476 bu.	.....
Wheat	3,993,318 bu.	.....
Building stone	6,702 tons.	.....
Copper	8,628 tons.	.....
Manufactured iron	.....	12,802 tons.
Iron, ore	812,153 tons.	.....
Iron, pig	9,525 tons.	.....
Salt	.....	27,544 bbls.
Lumber	96,080 M feet	.....
Silver ore	290 tons.	.....
Unclassified freight	15,743 tons.	46,277 tons.
Passengers	1,497	1,472

Coal Movement to Lake Superior.

As shown by the following table, coal shipments, hard and soft, to Lake Superior ports from the opening of navigation to Oct. 1, were 313,008 tons in excess of shipments on the corresponding date in 1891:

Months.	1892, net tons.	1891, net tons.
April	151,495	10,919
May	401,729	404,698
June	462,564	390,674
July	542,003	436,254
August	414,448	428,842
September	363,673	351,517
Total	2,335,912	2,022,904

The figures are from the monthly statements of Sault canal business. On Oct. 1 hard coal shipments from Buffalo to all upper lake ports were only 174,585 tons ahead of the movement on the same date last year, so that it is still evident that the great bulk of the gain in Lake Superior shipments is soft coal.

Facts about Buoys and Fog Signals.

Following are facts about buoys and fog signals given out by the United States light-house service:

The siren foghorn, under the most favorable circumstances, can be heard thirty miles.

There are now nearly seventy whistling buoys on the United States coast. They weigh six tons each, and cost $1,000 each.

In the buoy service of the United States there are of all kinds nearly 5,000 buoys, maintained at a cost of nearly $400,000 a year.

Whistling buoys are so constructed that air is forced upward through an ordinary steam whistle, when the buoy rises and falls with the waves.

The bell buoy is an iron float carrying a 300-pound bell. On a plate under the bell, a cannon ball is free to roll around and strike the bell as the waves disturb the buoy.

The United States has beaten the world on fog signal devices, and they are being adopted by European nations. Of the signals in the United States service there are 100, and their cost was $700,000.

Bell buoys are best adapted to shallow water, where the whistling buoy could not ride, and are preferred in rivers and harbors, while the whistling buoy is required in the open sea or in roadsteads. The service has about seventy-five bell buoys, which cost $300 apiece.

The manner of marking buoys is also a guide to the mariner. Red buoys with even numbers being placed on the right hand side, and black buoys with odd numbers on the left hand side of channels, approached from seaward. Buoys painted with red and black horizontal stripes are placed on shoals or wrecks, having a safe channel on either side, while perpendicular stripes indicate that the only safe channel is close to the buoy.

MARINE REVIEW for one year and Patterson's Nautical Dictionary for $6.

Work of the Ship Yards.

The keel for the New York Central or Western line boat will be laid this week at the Wyandotte yard of the Detroit Dry Dock Company. The immense straight-back at the same yard, for Eddy Bros. of Saginaw is expected to be ready for a cargo by the end of the month.

The steel steamer Thomas Maytham was launched at the yard of the Chicago Ship Building Company, Saturday. She will be ready for service Nov. 1. The keel for the Elphicke boat has been laid. Her name will be Thomas Orr.

David Bell, Buffalo, will build the revenue cutter, Calumet, for government service at Chicago. The price is $38,500. She is to be completed early next season.

One of four schooners, building by James Davidson, West Bay City, was launched Saturday. She will tow with one of the Davidson steamers. Earlier in the week a 112-foot tug was launched at the same yard. It is claimed she will make 15 miles an hour. The steam barge Oneida, rebuilt by Capt. Davidson, has again begun service in the lumber trade. She has been given an a 2 rating and a value of $35,000.

Wilson & Hendrie, proprietors Montague Iron Works of Montague, Mich. have just closed a contract with the Sands & Maxwell Lumber Company of Pentwater, Mich. for a fore and aft compound Marine engine 14 and 28-inch cylinders by 20 inch stroke; also one marine boiler 7 feet in diameter by 12 feet long to be placed in a new passenger steamer being built by the Grand Haven Ship Building Company of Grand Haven, Mich. The boat will be ready for duty March 1, and will run between Pentwater and Ludington.

The engines of the Lake Michigan and Lake Superior Transit Company's passenger steamer, contracted for by the Chicago Ship Building Company recently, will be built by the Cleveland Ship Building Company. The cylinders will be 23, 38 and 62 by 36 inches stroke, developing 1,800 horse-power. It is expected a regular speed of 110 turns will be secured. The two boilers will be double-ended 11 by 21 feet and each will have two furnaces. The wheel will be 13½ feet and have 20 feet pitch. The contract amounts to about $50,000.

Particulars of the Bonita.

The steam yacht Bonita, illustrated in the last issue of the REVIEW, was built by the Detroit Boat Works, and was designed by F. A. Ballin. She is owned by Messrs. Mark and E. W. Hopkins, of St. Clair, Mich. and San Francisco. She is 102½ feet long on water line, 120 feet on deck, 16 feet 1½ inches moulded beam on deck, 13½ feet on water line, 7 feet 10 inches moulded depth, draft amidship 3 feet 8½ inches. The construction is on the diagonal plan with double planking of North Carolina cedar, inside ½ inch and outside 1⅛ inches. Frames are sawed out of 2¾-inch oak flitch, moulded 6 inches over keel, 3½ inches on top. The keel is 6 by 7-inch oak, keelsons 6 by 6-inch, sheerstrake 1½ by 11 inches, and clamps, shelves and keelson are southern pine. The engines, built by S. F. Hodge & Co., are 9¼, 14¼ and 24 by 14 inches stroke, having independent air pump and condenser, and steam is furnished at 200 pounds pressure by a Roberts boiler. The propeller is 4 feet 4 inches by 8 feet pitch, and turning 300 revolutions makes 17 miles an hour. In addition to driving machinery there is an electric light plant and ventilating machinery. A battery of 25 Woodward cells is charged by a Westinghouse Junior engine and supplies the 30 incandescent lamps, side, signal and head lights. The interior arrangements are very complete. Forward on deck are the dining-room and pilot house, furnished in the highest style in natural mahogany. Below deck, directly forward of engine bulkhead is the galley and forward of this are the crew's quarters accommodating six men. From the galley a tunnel containing a small carriage, connects with the after cabin and permits of serving food there without going on deck. A dumb waiter runs up to the dining-room. Aft of the machinery bulkhead, reached by a mahogany companionway, are the owners' and guests' quarters. There are two large staterooms for the owners, each one equipped with all modern conveniences, such as hot and cold water, wash stand, bath-tub and water closets. The large saloon is 14 feet long and the full width of the boat, with cushioned seats along the outsides, which may be used to accommodate four passengers. All the woodwork is of natural color mahogany and all decorations in white and gold. By means of a trunk skylight, which only projects 16 inches above the deck, where it serves as seats, the headroom in the cabins is over 8 feet high, and by means of a skylight on top of trunk, they are efficiently lighted and ventilaled. There is another stateroom along and another back of the companionway, and on the port side a toilet room for guests. The upholstery is in peacock green plush.

The yacht has ample deck room and can take care of a large party. She has just returned from a cruise down the St. Lawrence. The cost is said to be $25,000, and she is pronounced by competent judges the most complete, handsomest and cheapest yacht of her class ever built on the lakes.

In General.

A 110-foot yacht is being built in San Francisco under the direction of Capt. McNevin. One feature of interest in the boat is the auxiliary rudder which is set in the counter keel.

It is claimed that W. K. Vanderbilt will build two steam yachts to replace the Alva, one for deep sea cruising and one for coasting between New York and Newport. The latter will be very speedy.

Harland & Wolff, Belfast, recently launched a cattle ship named Sagamore. She is somewhat larger than the whale-back barge Sagamore, being 430 feet long and 46 feet beam, with a gross tonnage of 5,280.

On the first Saturday in October a freight steamer and two tugs were launched at Baltimore. The steamer and steel tug were built by the Maryland Steel Company and the wooden tug by the James Clark Company.

Capt. Townsend, corps of United States engineers, has 1,200 men at revetment work in the Mississippi river. The 3,000,000 yards of levee work in his district will be given out under contract, but contractors are prohibited from working men more than eight hours.

The Iowa Iron Works of Dubuque, Iowa, has been awarded the contract for building the new revenue cutter William Windom, to be stationed at Baltimore. The new cutter will be 170 feet long and will have a displacement of 400 tons. She is to be built for $98,500

Copies of specifications filed in connection with an application in Great Britain for a patent on one of the McDougall whaleback tow barges may be had for 8½d. on application to Sale Branch, No. 38 Cursitor street, London, E. C. The number of the patent is 9,105.

Commodore Hite started in a little boat called the Montana two years ago 600 miles above the point of steamboat navigation on the Miississippi river. He has covered 3,600 miles working down the river and has some distance yet to cover. He passed through nearly 800 miles without seeing signs of habitation.

If laid out at full length, the rail above the bulwarks of a modern lake steamer would measure a little more than an eighth of a mile, or in other words one would cover about that distance in walking around one of these boats. This is an object lesson prompted by a Bay City paper in noting the departure of one of the new wooden steamers of the Davidson fleet.

Preparations are now being made for the construction of the last of the naval vessels authorized by congress. The navy department on Wednesday last issued proposals for the construction of a cruiser and a battle ship, to cost about $4,000,000 each. The former will be 400 feet long and 64 feet beam, and the engines will have 16,000 horse-power. The boat will steam 15,000 miles at a ten-knot rate. The battle ship will be 360 feet by 48 feet, and her engines will be of 11,000 horse power.

It is not generally known that the first steamboat ever built in the United States was partly constructed in Frederick county, Maryland, in the year 1785. The vessel was built by James Rumsey at Shepherdstown, W. Va. Robert Fulton, with his Clermont, was anticipated twenty-two years. The steamboat was fitted up with machinery partly manufactured at the Catoctin furnace, near Frederick. The boiler, two cylinders, pipes, etc., were manufactured in Baltimore. Some portions of the works were made at the Antietam Iron Works. On March 14, 1786, a public experiment, the first ever undertaken in America, according to the Frederick News, was made on the Potomac river. Rumsey succeeded in attaining a speed of four miles an hour against the current. The steamboat was eighty feet long. It was propelled by a steam engine, which worked a vertical pump in the middle of the vessel, by which the water was drawn in at the bow and discharged through a horizonal trunk at the stern.—Journal of Commerce.

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

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The books of the United States treasury department contain the names of 3,600 vessels, measuring 1,154,870.38 tons in the lake trade. In classification of this fleet the lakes have more steamboats of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of vessels of 1,000 to 2,500 tons on the lakes on June 30, 1891, was 310 and their aggregate gross tonnage 512,787.58; in all other parts of the country the number of this class of vessels was, on the same date, 213 and their gross tonnage 319,750.84. The classification of the entire lake fleet is as follows:

Class.	Number.	Tonnage.
Steam vessels	1,592	756,751.53
Sailing vessels	1,243	325,131.06
Canal boats	703	72,515 42
Barges	62	20,472.37
Total	3,600	1,154,870.38

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	No. of boats.	Net Tonnage.
1887	152	56,488.32
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
Total	1,021	485,042.94

St. Mary's Falls and Suez canal traffic: Number of boats through St. Mary's Falls canal in 1890, 228 days of navigation, 10,557; tonnage, net registered, 8,454,435. Number of boats through Suez canal during 1890, full year, 3,389; tonnage, net registered, 6,890,014. Number of boats through St. Mary's Falls canal in 1891, 225 days of navigation, 10,191; tonnage, net registered, 8,400,685. Number of boats through Suez canal during 1891, full year, 4,207; tonnage, net registered, 8,698,777.

Entered at Cleveland Post Office as Second-class Mail Matter.

OUR Washington correspondent made an effort last week to secure a copy of the minority report from the light-house board to Secretary Foster, in the case of Col. Lndlow and Commander Heyerman. The executive officers of the board refused to give out this report, although Secretary Foster had publicly referred to it and it was a matter of record among the proceedings of the board. A little inquiry in Washington has brought out a copy of the document, however. It is addressed to Secretary Foster, signed by three members of the board, and is as follows:

"We the undersigned members of the light-house board and a minority thereof, beg leave to inform you that we dissent from the recent action of the board in the matter of Major William Ludlow, corps of engineers, U. S. A., and Commander Oscar F. Heyerman, U. S. N., lately engineer and inspector of the eleventh light-house district. It is our judgment that the explanation of these officers in respect of their recent action and correspondence with the board concerning the lighting of St. Mary's river fully exonerates them from any wrong doing or intent. We believe on the contrary that they have shown great professional ability and zeal in the light-house service, especially in the work referred to and that they should be restored to their duties under the board. We think it due to you, to them, and to ourselves to make this statement."

The case of these two officers is still pending with Secretary Foster, but the vessel interests seem as determined as ever. There will be no let up until a satisfactory final adjustment is had.

NEARLY all of the best class of freight and passenger vessels on the lakes are now equipped with electric lighting plants, and there is no doubt that electricity as an illuminant on ship board is cheaper in the long run, more convenient and generally safer than any other light. Owners of new vessels seeking electric plants will do well to remember, however, that great care should be taken with regard to this part of the equipment of their floating property. Aside from the advantages derived from plants specially adapted to ships there is a marked element of danger in defective insulation. Insulation of electric wires on vessels has not yet reached perfection. Owners should give some study to the matter of electric lighting and secure the best plants.

IT WAS in 1792 that the first act concerning the construction of the canals of New York state passed the state legislature, so that the convention in Buffalo on the 19th inst. will be in the nature of a centennial celebration. As a convention intended for the purpose of bringing about improvement to the canals, however, it will undoubtedly be of little account. As yet there is little interest shown regarding the convention, even as a celebration. Only a radical enlargement of the Erie canal will interest the people of New York. The state can not be expected to undertake the enlargement demanded by the growth of commerce from the lakes to the seaboard and any half-way methods of improvement will not excite interest.

LAKE ship builders will have to take into consideration the effect of the eight-hour law in figuring on government work, and add about one-fifth to the usual amount figured for labor. Before a ruling regarding this law was made by the treasury department, the Union Dry Dock Company, Buffalo, made estimates and was given the contract for the revenue cutter Calumet, for $36,675. Later it was decided that the eight-hour law applied to the contract, and the company withdrew its figures. Since then the contract has been given to David Bell, of Buffalo, for $38,500.

IT IS difficult to believe that Gen. Casey, chief of army engineers has interfered in the case of Col. Ludlow and Commander Heyerman with the light-house board. He is said to be opposed to the reinstatement of these officers.

Strange Views of Lake Navigation.

The story of a captain who took a schooner across the Atlantic with a cargo of wheat from the lakes, and being unable to get insured for the return trip, because no information of the great lake ports was to be found, is well known, as is also the one about English underwriters being surprised that lake vessels were navigated at night instead of tying up along the "bank," but a recent instance more interesting is given by a New York engineer. He accompanied Mr. Johnson, the English capitalist interested in building of whalebacks in England, on his first trip up the lakes. While in the rivers, Mr. Johnson asked if they would not reach Duluth by night-fall. When told that he would have to pass through two large lakes on which he would be out of sight of land for several hours and cover some 600 miles, he shook his head and wondered. Nearing the end of his journey, he ventured to suggest that it couldn't be far from the Pacific Ocean, but subsided when told that the half-way point in crossing the continent was still several hundred miles west of him. Some foreigners, as well as eastern business men, have had their doubts dispelled as to the immense traffic of the lakes, but many are still wofully ignorant of that as well as of their great area. The following will give an idea of the magnitude of the great lakes:

The water surface of Lakes Ontario, Erie, Huron, Michigan and Superior, and connecting waterways, is 95,275 square miles, while the area of Great Britain, England, Scotland and Wales combined, is only 88,781 square miles. The coast lines of the great lakes contain more than half the fresh water on the globe and have a combined length of 3,075 miles. It is 1,279 miles from Ogdensburg to Dnluth, and from the northern shore of Lake Superior to the southern end of Lake Michigan is 520 miles. The distance from Chicago to Liverpool is 4,500 miles, one-half of which is covered by the great lakes and St. Lawrence river. From the Straits of Belle Isle to Duluth, at the head of Lake Superior, is 2,259¾ miles. From the Straits of Belle Isle to Liverpool is 2,234 miles. From the Straits of Belle Isle to Kingston, Lake Ontario, is 1,164 miles. From Kingston to Duluth it is 1,186 miles, over one-half of the distance from the Straits of Belle Isle across the Atlantic to Liverpool.

It is reported that Capt. Ruelle has ordered a $15,000 tug from the Detroit Dry Dock Company.

David Bell of Buffalo is putting in a heating furnace and steam hammer and will hereafter do some work in a forging line.

The steamer W. H. Gilbert delivered at Buffalo this week 38,000 barrels of flour from Gladstone. This is equal to 3,800 tons.

Powell & Mitchell, Marquette, Mich., were lowest bidders at $34,680 for extension and repairing of the Grand Marais harbor of refuge pier.

J. S. Jones of Chicago and H. D. Turney and other prominent coal men from Columbus were in Duluth, Wednesday, negotiating for grounds for coal docks. They represent interests owning docks at Manitowoc and Ashland.

A 10,000,000-foot raft of logs belonging to Sibley & Bearinger, of Saginaw, and Saxe Brothers, of Albany, has been towed from Georgian bay to Tawas in patent booms. It is said to be the largest ever towed on the lakes.

Among the bidders for extending Marquette breakwater 750 feet were the Wisconsin Dredge Company, Campbell & McDonald, of Duluth, Hugh Steele of Duluth, Sang, Moore & Nicholson, of Marquette, Bernier & Lautz, of Green Bay, and Powell & Mitchell, of Marquette, the latter being the lowest bidder at $65,351. This company has secured a $27,000 contract for a breakwater at Two Harbors, and is figuring for work at Grand Marais, bids for which will be opened soon at Duluth.

The steamer Joys has made a phenomenal record this season. From June 1 to date she has carried 15,000,000 feet of lumber from Girard's mill in Menominee to Sanger, Rockwell & Co.'s dock in Milwaukee. She has passed through the Sturgeon bay canal more times during a month than any other steamer since the canal was opened. As the distance between the two points is 100 miles, the Joys has run upwards of 3,900 miles, or an average of 100 miles per day, including the loss of one day at each end of the route in taking on and discharging cargo. She has averaged nine and one-half round trips each month.—Milwaukee Evening Wisconsin.

Wrecks and Heavy Losses.

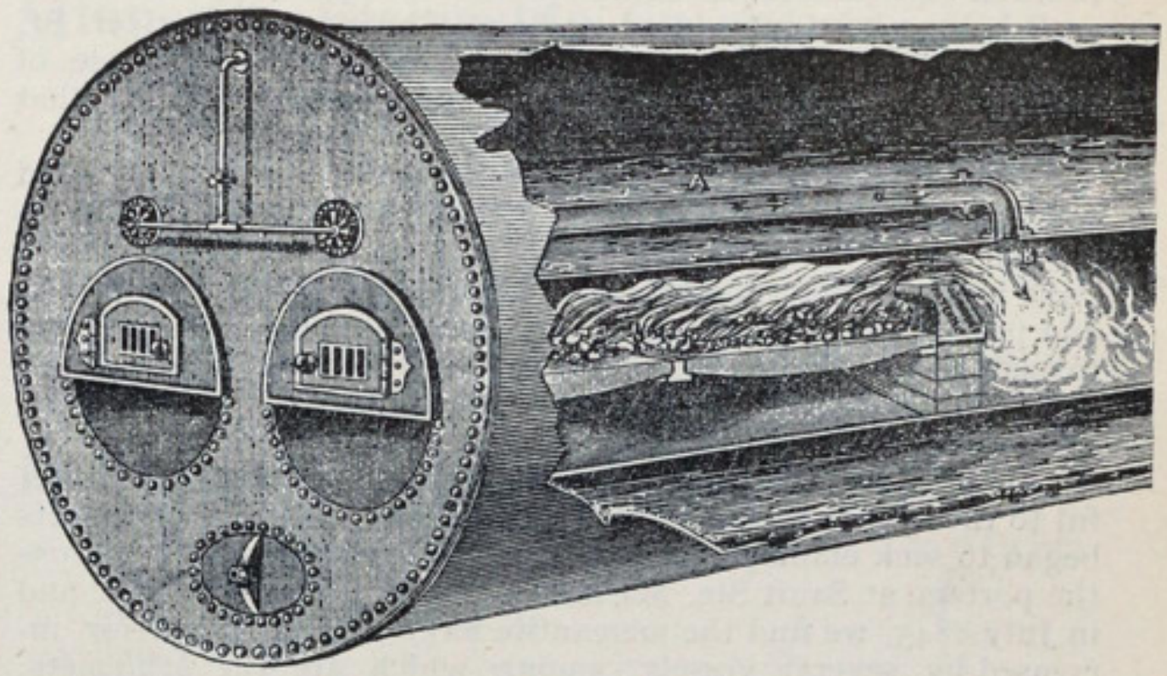
The steambarge Nashua, owned by J. J. McLain and Capt. Richard Millen of Detroit and valued at $15,000, was lost last week with a crew of thirteen and two passengers. The barge Ryan in tow of the Nashua was dropped and at daylight saw the steamer flying a signal of distress. This was told to the master of the steamer Gratwick who spent four hours looking for the Nashua. A few days later the wreck was found bottom side up, and Tuesday the body of Mrs. Shepherd, wife of the mate, was found on the beach near Goderich. Among the lost were Pilot Archie Muir, Capt. Richard Millen and wife, Engineer John Putnam, Mate Charles Shepherd and wife, Joseph H. Wilson, firman; George McCullam, watchman; Henry J. Wagner, second engineer, and two wheelmen, two firemen and two deck hands whose names are unknown. The vessel had a cargo valued at $15,000. Both vessel and cargo were insured.

The steamers Republic and Norman, which collided last week at the turn in Lake George where the Peck was sunk last season, were not as badly damaged as was at first supposed. Repairs to both boats will be made in Cleveland inside of two weeks and the cost in either case will not be more than about $5,000.

A Simple and Successful Smoke Consumer.

A system or device for the prevention of smoke that has been tested and proven a success is a curiosity, and for that reason as well as the benefit that will result to Chicago tug men if it proves a success on their tugs, the engraving below and the accompanying description are reproduced from the Engineers' Gazette, London.

Atmospheric air is conducted from the exterior of the boiler through pipes into the combustion chambers. The amount of air demanded varies with the different kinds of coal and changes in the weather, and this is controlled by a regulating valve. The inlet air pipes are run from the front end of the boiler and pass through the water or steam space in the boiler, the firing flues, ash or cinder space, the economizer, the side or bottom flues, as most convenient. This air admitted through the pipe becomes intensely heated as it passes through the hottest part of the boiler, and evaporates condensation in the combustion chambers. A steam jet may be introduced to give additional pressure and it can be turned on when firing up. The air passing through this pipe attains a temperature of at least 180 degrees and when it comes in contact with the flames and unconsumed gases passing over the bridge a brilliant ignition



takes place, causing a perfect combustion at the right time and place. Where there is a draft of 1,000 feet per minute a 3-inch copper pipe is sufficient for average coal, but where the draft is only 600 or 700 feet per minute a 1-16 inch steam jet is recommended. The use of the jet with steam at eighty pounds supplies as much super-heated oxygen through the pipes into the combustion chambers as passes ordinarily through the spaces between the fire bars in the furnaces, and is economical in results as well as doing away with the smoke. After cutting the face plates and at crown of flues the flanges should be caulked and riveted on both sides, thus strengthening the plates and staying the flues. The inventor is Mr. Robert Johnson, 126 Market street, Manchester, England. The article does not state if the patent has been secured in the United States.

Personal Mention.

Capt. James Millen and Aaron A. Parker of Parker & Millen, Detroit, were in Cleveland Wednesday.

Capt. Patrick Ryan of the steambarge John E. Hall died suddenly aboard his boat on Lake Huron early Sunday morning.

Capt. McEchron, mate of the whaleback steamer Samuel Mather, is to be made master of one of the new whaleback barges building at Superior.

Capt. J. W. Nicholson, who was several years in the Orient line and who had command of the steamer Vienna when she was sunk in collision with the steamer Nipigon a short time ago, has been appointed master of the steamer St. Lawrence.

The Nautical Magazine, London, says in a description of the 3,600-ton bark James Kerr that modern improvements have enabled owners of sailing ships to reduce the number of men employed. One of the improvements mentioned is the use of small capstans, with which the heavy top-sail yards, weighing four tons apiece, can be hoisted by five men. Instead of requiring all hands a third of the watch is sufficient. It adds that the capstans are turned by winch handles and are manufactured by the American Ship Windlass Company.

Capt. Dennis Sullivan, who was in Cleveland on his way down the lakes after the Neshoto was released from Keweenaw point, speaks very highly of the wrecking outfit carried by the Swain Wrecking Company's tug Favorite. He says the boat carries everything that might possibly be used on a wreck, and he pronounces the pumps the best he ever saw at work. Any of them—there are four—will raise water thirty feet and they are always ready for immediate and continuous use. With the Favorite, he says, there is no need of delay or expense in sending after apparatus so often found wanting after a wreck is visited.

Short History of Lake Navigation.

(By C. H. Keep, Secretary Lake Carriers' Association.)

EARLY HISTORY OF NAVIGATION ON LAKE SUPERIOR.

Such was and continued to be the mercantile navy of the waters of Lake Superior until the supposed discovery of copper in working quantities on its shores, about the years 1843 and 1844. This increased the prospective richness of the Lake Superior country to such an extent that capitalists and explorers began to turn their attention thereto, the principal objective points being in the vicinity of Copper harbor, on point Keweenaw, and in the interior some 14 miles from the mouth of the Ontonagon river. The early pioneers were obliged to make the trip from Sault Ste. Marie to Copper Harbor and Ontonagon in birch bark canoes, Mackinaw boats or batteaux, the latter craft having been introduced on Lake Superior from river St. Lawrence by the Hudson Bay Company, for the purpose of moving their supplies, furs, etc., from one extreme end of that lake to the other.

These boats were all open, without decks of any kind, and were propelled by paddles, ores, and sails, as circumstances required. They followed the coast and its indentations, made their landings upon the shores for purpose of allowing crews and passengers to camp, sleep and prepare their food, as well as to seek shelter by day or by night from the storms with which they were unfitted to cope, and which were frequently encountered.

This mode of traveling, however, was tedious and distasteful to the copper seeker, and in 1844 and 1845 vessel owners began to seek employment and profit by hauling vessels across the portage at Sault Ste. Marie, a distance of about 1 mile, and in July 1845, we find the mercantile navy of Lake Superior increased by several vessels, among which are the schooners: Algonquin, Uncle Tom, Swallow, Ocean, Chippewa, Siskowit, Merchant, Fur Trader and Whitefish, the latter being owned by the Hudson Bay Company. These were followed later on in the same season by the advent of the propeller Independence, of 260 tons burden, and commanded by A. J. Averill, of Chicago, the first steam craft that ever disturbed the waters of Lake Superior. The schooner Napoleon, in neighborhood of 200 tons, built at Sault Ste. Marie for account of Oliver Newberry, Esq., of Detroit, was also put in commission late the same fall (1845.)

After this date as the business of the country demanded, other craft were hauled across the portage and added to the fleet as follows, viz: The steamer Julia Palmer in 1846, and at intervals prior to the opening of St. Marys Falls canal at Sault Ste. Marie in 1855, the propellers Manhattan and Monticello, schooner George W. Ford, propeller Peninsular and the side-wheel steamers Baltimore and Sam Ward. In the meantime, the schooner Napoleon had been converted into a first-class passenger propeller in about the year 1850. The foregoing sail vessels and steamers ranged from about 25 to 500 tons burden.

As we have been informed by one of the Lake Superior pioneers of 1845, he made his first trip in July of that year on board of the schooner Chippewa, 25 tons burden commanded by Thomas Clark, sailed by himself and one man, who officiated in the capacity of mate, deck hand and cook. At the time, there were some forty passengers on board the vessel, among whom was the late Hon. David Henshaw, of Boston, president of one of the first copper mining companies organized (The Boston and Lake Superior Mining Company,) and formerly secretary of the navy. The passengers were obliged to feed themselves and sleep as best they could, Mr. Henshaw occupying the captain's berth in the cabin, while the balance of the passengers slept, as circumstances permitted, in the hold of the vessel and on deck.

Coincident with the building of the Astor, on Lake Superior in 1834 the American Fur Company also built a brig, the Ramsey Crooks, as a connecting link in their trade between the waters of Lake Erie (Detroit being the principal point) and Lake Superior, via the Portage at the "Soo" (that being the name which the Jesuit pioneers of the seventeenth century adopted as an abbreviation of the longer name Sault Ste. Marie.) That vessel, with the schooner General Warren, built about the same time and owned by the late Dr. John L. Whiting, of Detroit, with the exception of an occasional steamer going to Sault Ste. Marie with troops and government supplies for Fort Brady and Fort Wilkins, formed the only water connection between Lake Superior and the lower lakes until after the discovery of copper. This warranted the placing of the side-wheel steamer Detroit, owned by the late Capt. E. B. Ward (then of St. Clair Mich.,) on the route between Sault Ste. Marie, and in 1845 she commenced making regular weekly trips.

In the spring of 1846 the steamer Ben. Franklin was put upon the route, where she continued to run until 1850, when she was wrecked at Thunder bay, Lake Huron. These were followed at intervals, as the exigencies of the trade required, by the steamers Northerner, London, Tecumseh, Albany, Illinois, E. K. Collins, North Star, and the propellers Goliah and Peninsular, as well as two small steamers, the Gore and Plowboy, which were put on the Canadian route as between Owen Sound (Georgian bay) and the "Soo."

These, as a rule, were all light-draught vessels, and had comparitively little difficulty in navigating the St. Mary's river as it then was, the greatest obstacle being found on that part known as Lake George, where the channel then ran in close proximity to the Canadian shore, and in which about two miles from the western end of the lake a bar existed that at times caused serious trouble, so much so that the American Fur Company, after the building of the brig Ramsey Crooks, in the then absence of tugs or other steam assistance, was forced to build a crib or pier on either side of the bar for purpose of heaving the vessel over it and at times lightering her, again transferring the freight by small boats or scows to the vessel after getting her over the bar into deep water.

This same pier, being kept in repair, was used more or less for the same purpose by other vessels until the deepening of a more direct channel through Lake George by the United States government after the opening of the Sault canal in 1855.

With a view to showing the extent of the transportation of freights, baggage, mining company supplies, etc., between Lake Huron, the Sault river and Lake Superior, it may here be well to say that the late Sheldon McKnight of Detroit, holding an official commission from the government as connected with the permits for the exploration of the copper lands of Lake Superior, and residing at Sault Ste. Marie, during the years of 1844 and 1845,did all the transferring of such articles across the portage thereat by means of one old gray horse and cart.

In the spring of 1846 the volume of business seemed to justify Mr. McKnight in building a warehouse and dock below the rapids at Sault Ste. Marie to better facilitate the hauling of freights. During 1846 and 1847 this was done by the firm of L. W. Tinker & Co. (composed of L. W. Tinker and Sheldon McKnight.) The volume of freight had so increased in the meantime that they were obliged to add to the old gray horse and cart two double teams.

In the spring of 1848, the firm of L. W. Tinker & Co. having been dissolved, Mr. McKnight employed Mr. J. T. Whiting, then of Detroit, to take charge of the business. Mr. Whiting found himself again obliged to increase the teaming facilities by adding thereto two more two-horse wagons and the necessary horses.

In 1850 the business had increased to such an extent that additional facilities for carrying freights in either direction across the portage induced Mr. McKnight to procure a charter for the formation of the Chippewa Portage Company under which a light tram road was built, running across the portage, operated by horses, and connecting the warehouses and docks at either end thereof, which, with sundry changes in the location of the tram, in consequence of the building of the canal, continued in use most of the time by day and by night through the season of navigation until the completion of the canal in 1855. By this tramway under favorable circumstances the company could move from 300 to 400 tons of freight, including mass copper, every twenty-four hours.

About 1851 the firm of Spaulding & Bacon, general merchants at Sault Ste. Marie, with a view to accomodating business brought to them by the steamer Northerner, running from Cleveland and connecting with the propeller Manhattan on Lake Superior (said two boats being owned by Samuel W. and A. A. Turner, of Cleveland, Ohio,) placed teams on the route across the portage, but after some two years abandoned the same, and all such freights, as well as those carried by the steamer E. K. Collins on the Lake Huron route, and the side-wheel steamer Sam Ward on Lake Superior, were diverted into the hands of the Chippewa Portage Company, and there remained until the opening of the canal.

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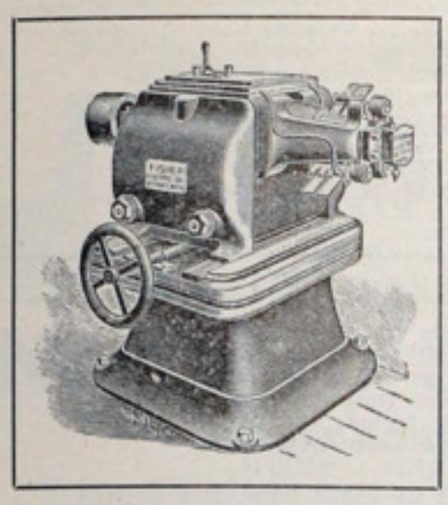

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S. R. Kirby ..... 200 lights.
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Pathfinder (whaleback) 225 incandescents and two arc lights.
Pioneer, (direct connected set, 150 incandescents and two arc lights.
Arthur Orr, (direct connected set) ..... 150 lights.
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Castalia, (another plant removed) ..... 200 "

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North Star ..... 225 lights.
North Wind ..... 225 "
Northern Light ..... 225 "
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Lake Superior Iron Co.

Griffin ..... 225 lights.
Wawatam ..... 225 "
La Salle, (another plant removed) ..... 200 "
Joliet, (another plant removed) ..... 200 "

Mutual Transportation Co.

Cambria ..... 225 lights.
Corsica ..... 225 "
Corona ..... 225 "

Minnesota Steamship Co.

Marina ..... 225 incandescents and two arc lights.
Masaba ..... 225 " " " " "
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Frank E. Kirby ..... 200 lights.
Greyhound ..... 60 "
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Bon Voyage ..... 75 "
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City of Detroit No. 2, (another plant removed) ... 650 "
City of Cleveland, (another plant removed ..... 650 "

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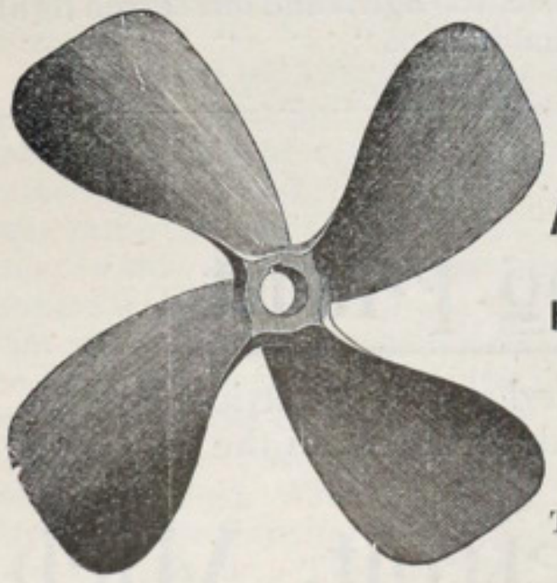

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UNITED STATES ENGINEER OFFICE, 121 Franklin street, Buffalo, N. Y., October 1, 1892. Sealed proposals for (1) Extension of north pier, Erie Harbor, Pa. (2) Rebuilding and repairing superstructure, breakwater and pier, Dunkirk Harbor, N. Y., will be received at this office until 2 p. m., November 1, 1892, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office MAJOR E. H. RUFFNER, Corps of Engineers. Oct, 20.

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio, Sept. 30, 1892. Sealed proposals for Extension of Breakwater at Cleveland Harbor, Ohio, will be received at this office, until 2 o'clock P.M., of Thursday, October 20th, 1892, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. JARED A. SMITH, Corps of Engineers, U. S. A.

U. S. ENGINEER OFFICE, HICKOX BUILDing, 185 Euclid Avenue, Cleveland, Ohio, September 30, 1892. Sealed proposals for Removal and Rebuilding of Piers at Ashtabula Harbor, Ohio, will be received at this office until 2 o'clock P.M. of Thursday, October 20, 1892, and then publicly opened. Specifications, blank forms, and all available information will be furnished on application to this office. JARED A. SMITH, Lieut.-Col. Corps of Engineers, U. S. A.

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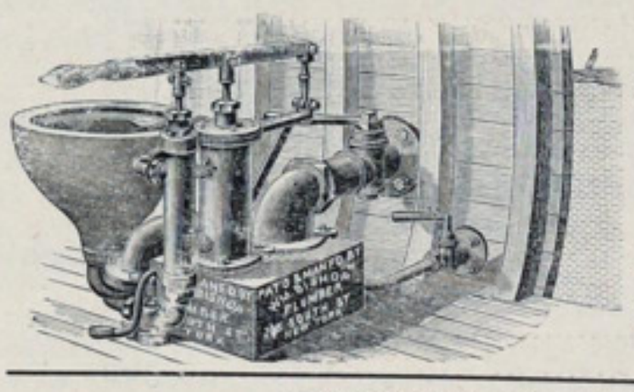

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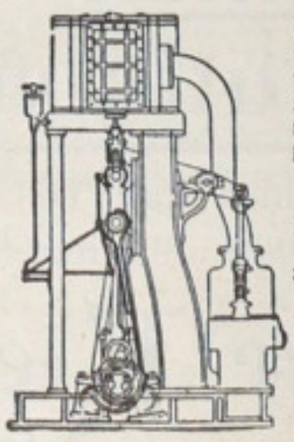

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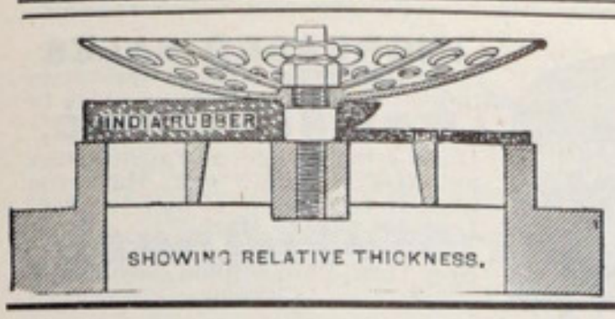

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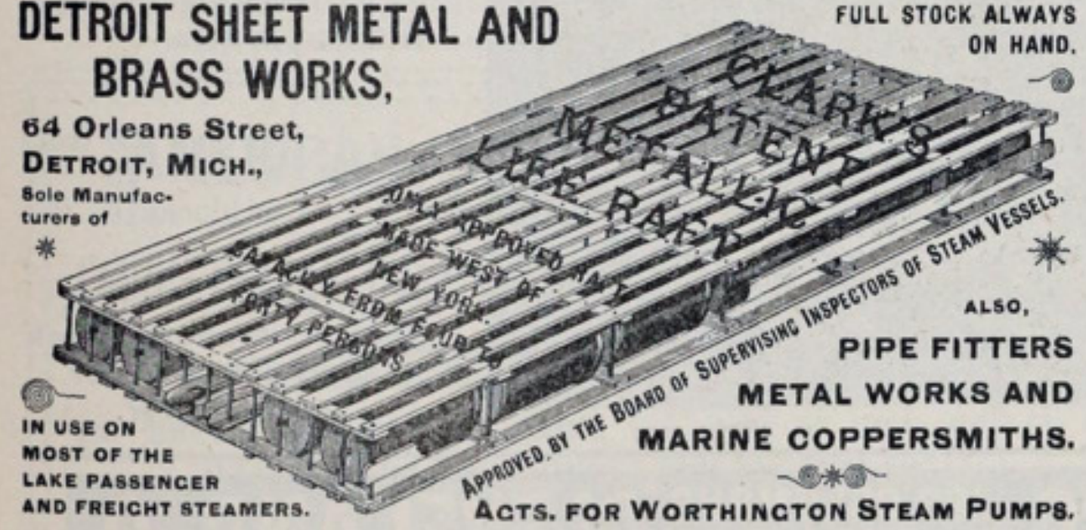

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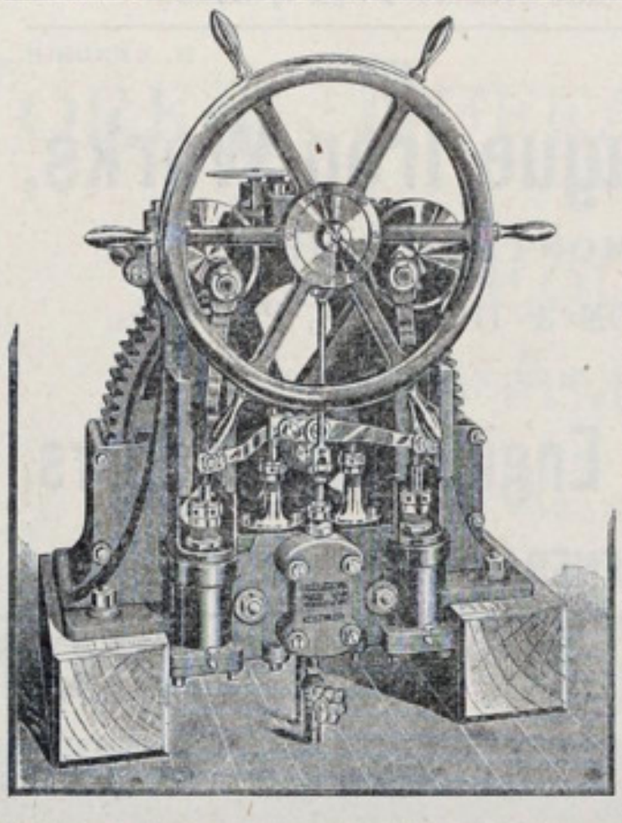

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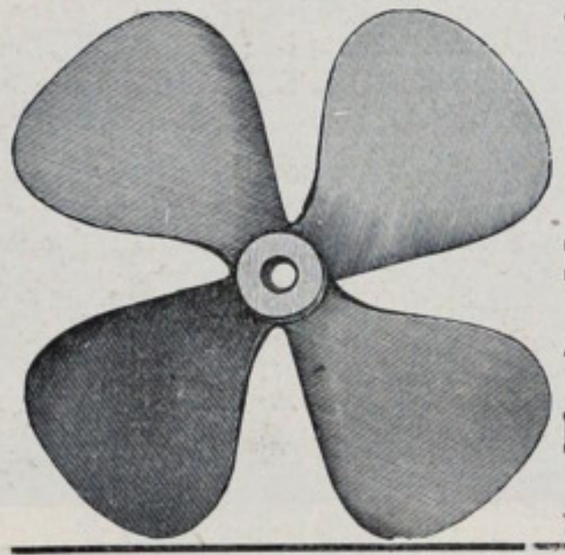

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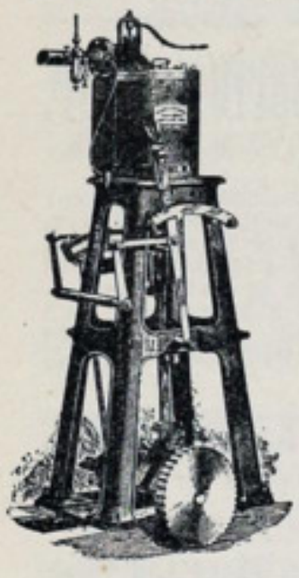

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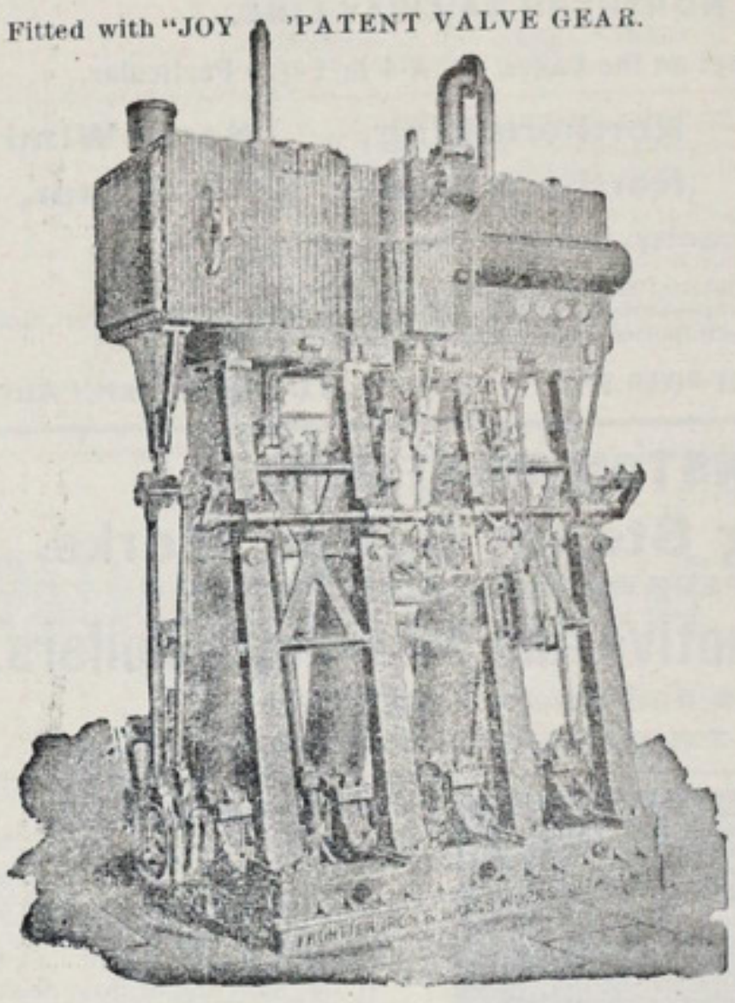

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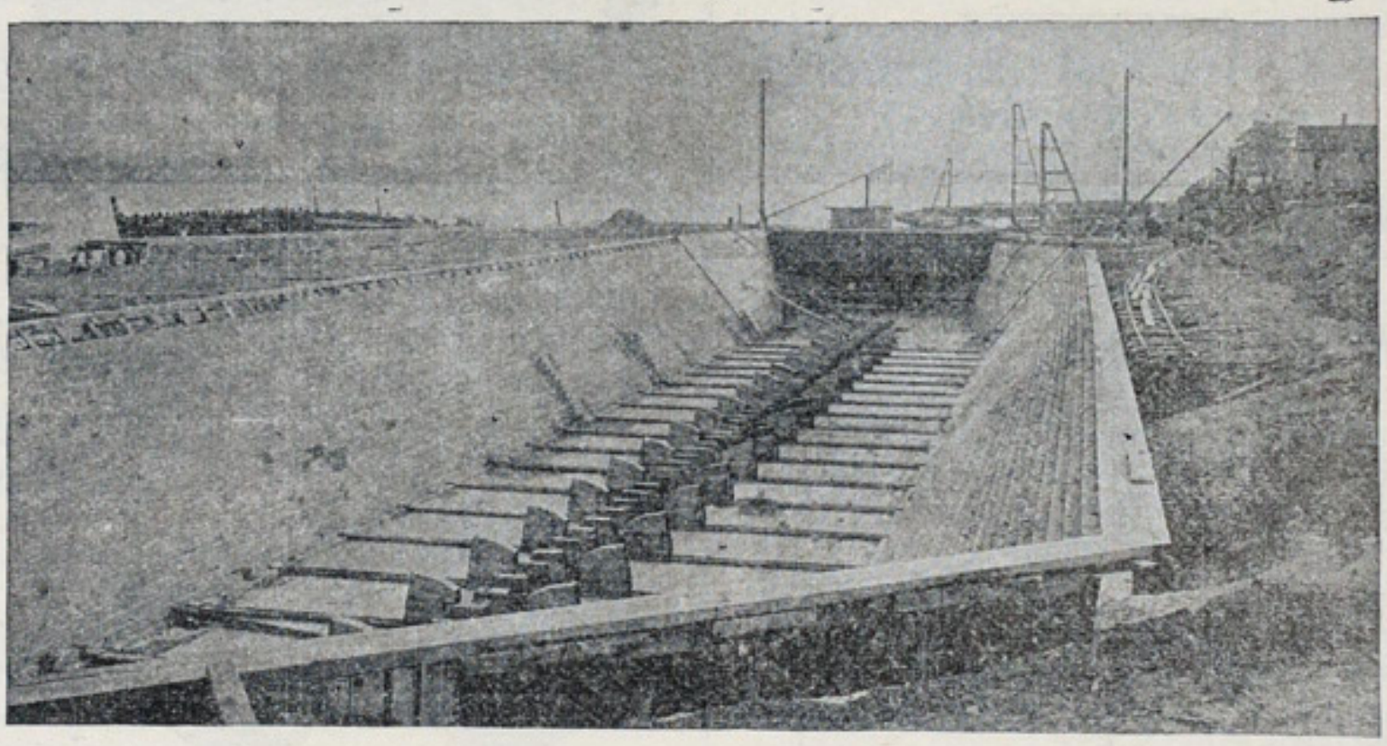

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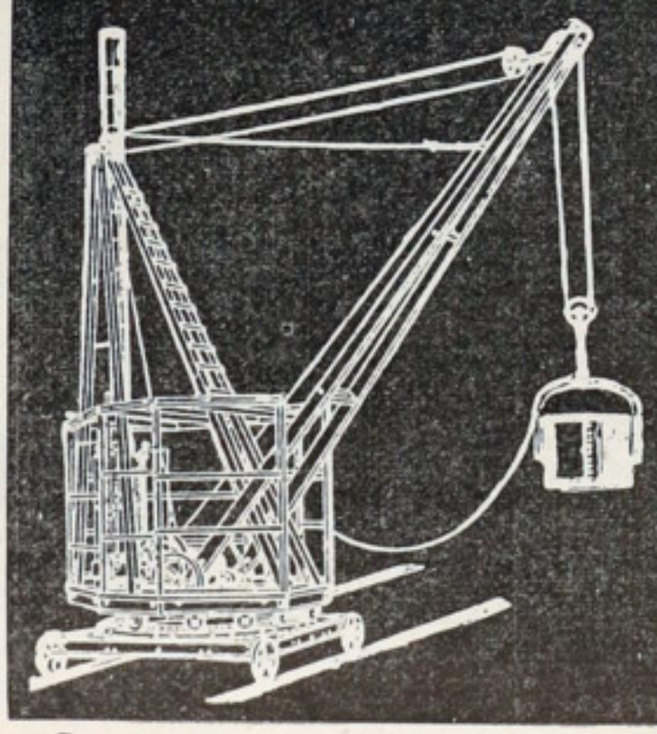

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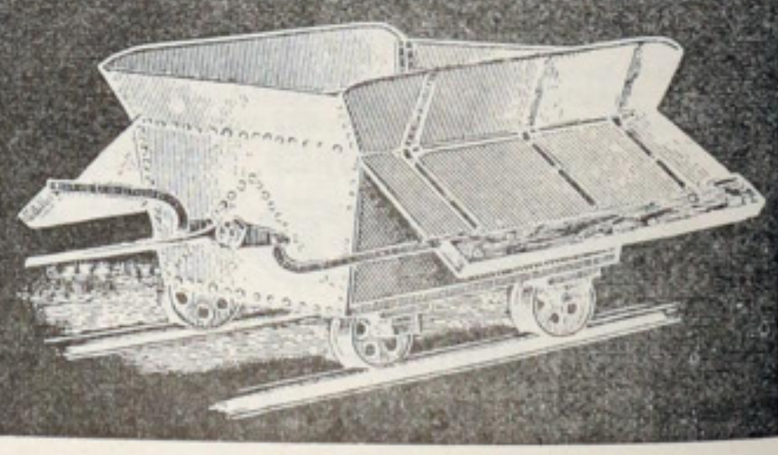

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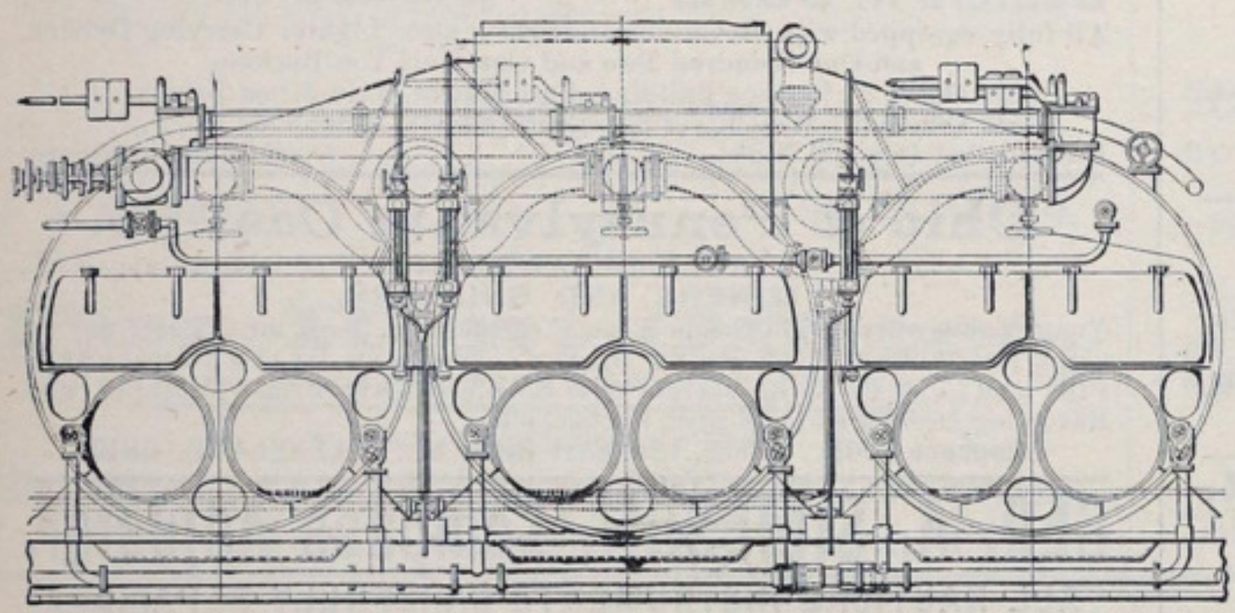

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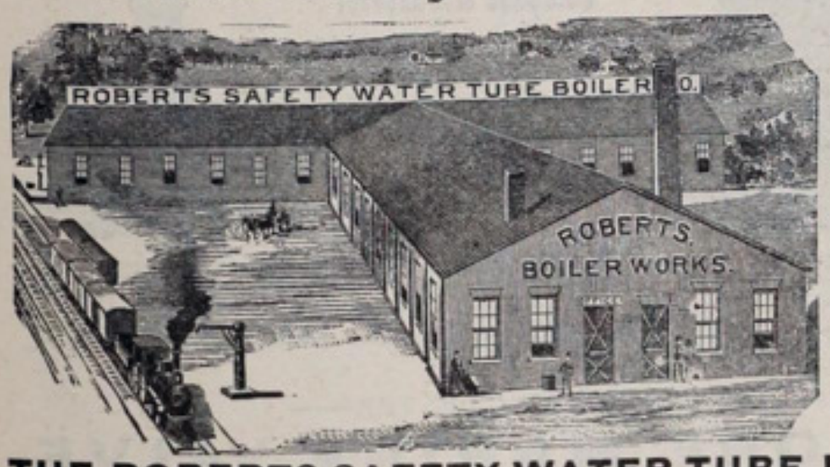

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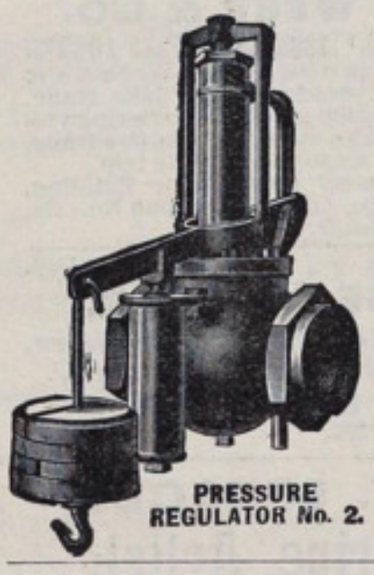

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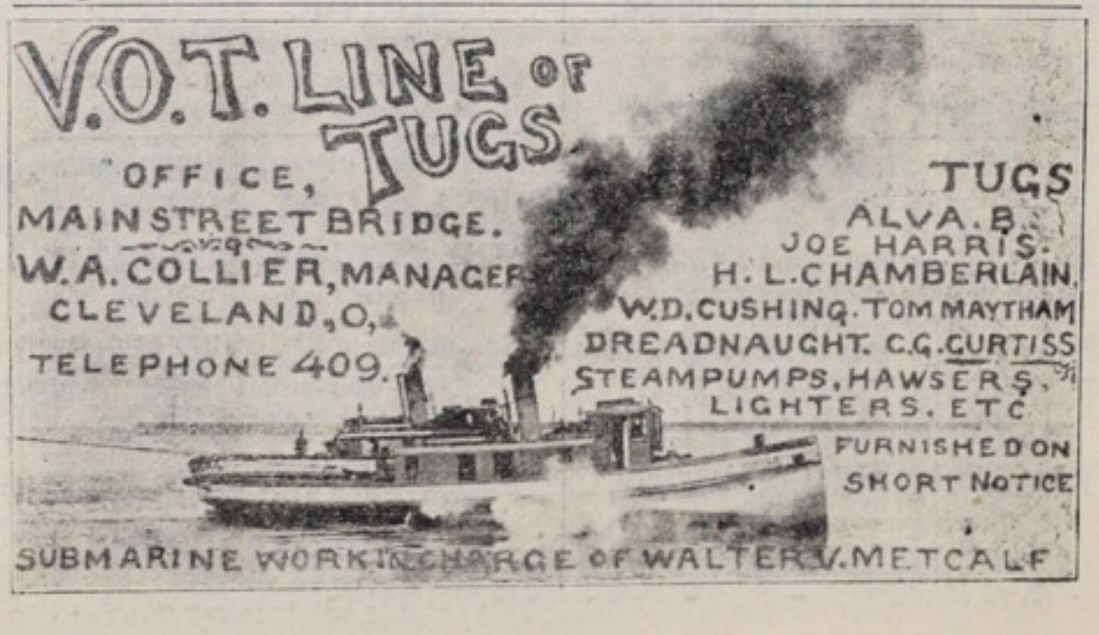

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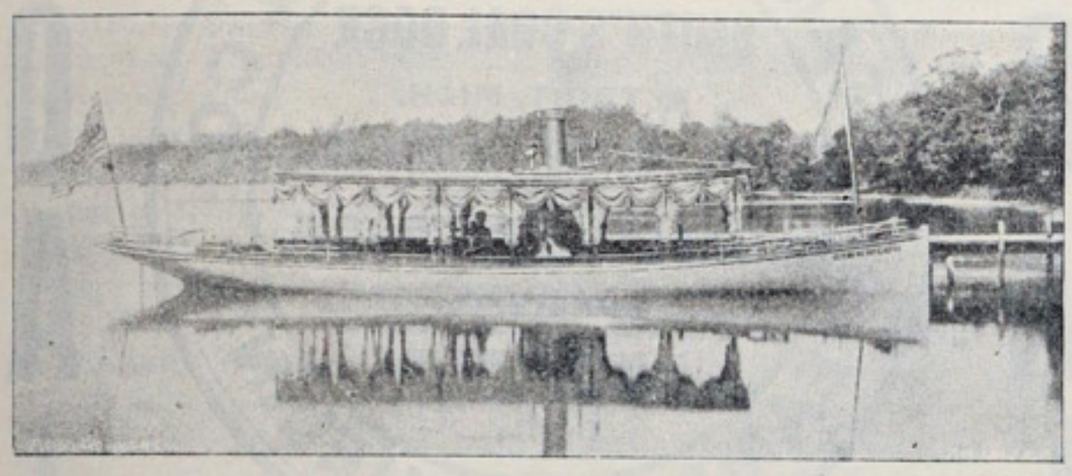

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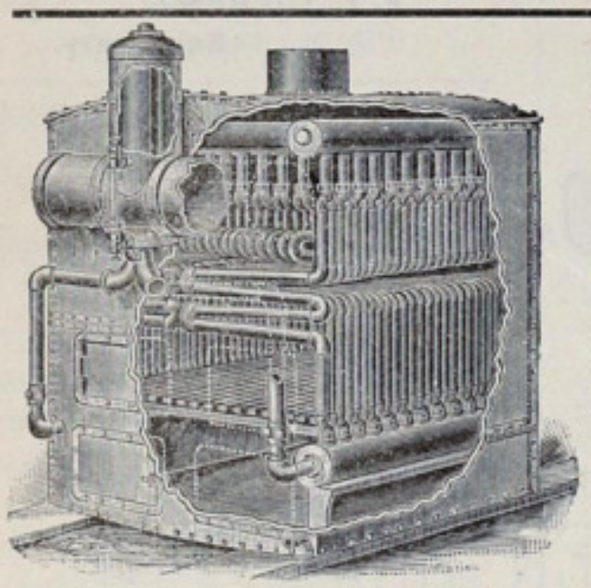

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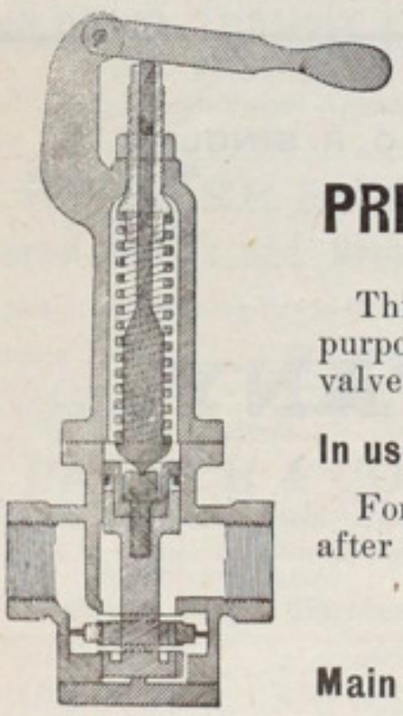

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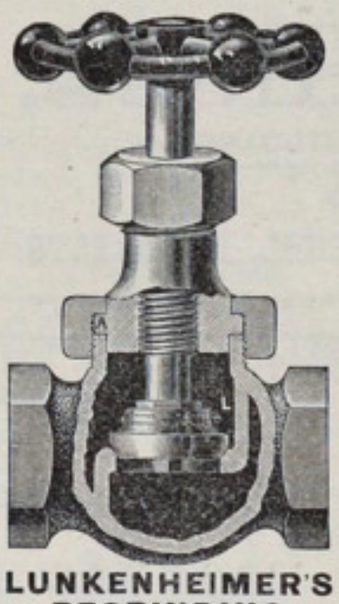

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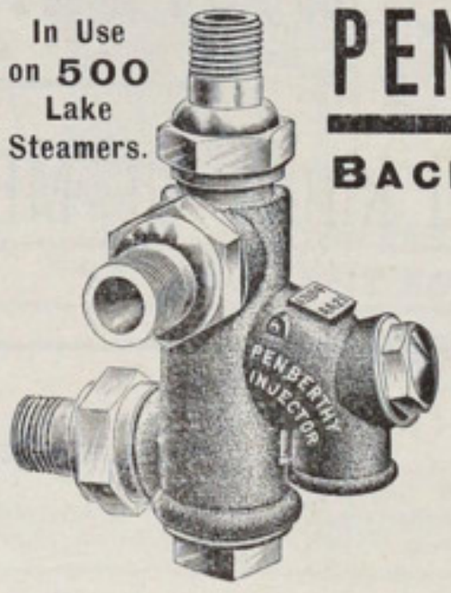

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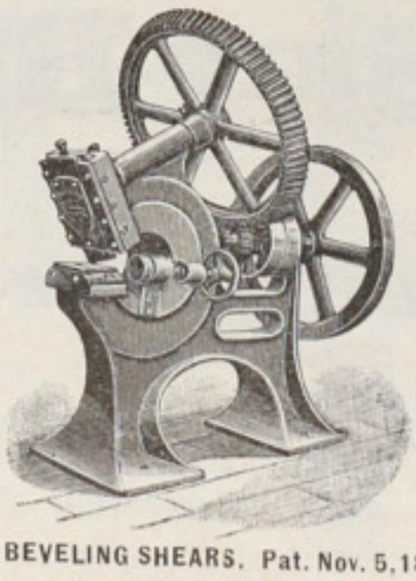

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